An Experiment in Relativity: Time Dilation and Space

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6-Twins Test for Time Rate relative to Space

Abstract: Does velocity in space cause time-lag relative only to observers as per Einstein's Relativity, or does time slow relative to space itself? A test can be done to determine definitively if there is a time rate proportional to space itself, and which merely *seems* as if it is relative to observers. It is known that a space ship at near-c velocity that stops and then resumes near-c velocity in opposite direction will have slow time, faster time, then slow time again. A scaled variation of the twin-paradox test can test this where any observed bias in direction will be evidence of rest velocity relative to space itself.

It is understood that if 1 "clock" is sent on a fast spaceship far away and then returned, that clock will have lost time compared to a "stationary" clock. This is the "Twin-Paradox" experiment. But does the direction of travel affect this experiment? An experiment can be done in 3 axii X, Y, and Z, with 2 opposite directions for each, making 6 ships clocks travel out and return. Each ship will be identical in construction, the only difference is the direction they travel. They accelerate initially A1 away from center ship S, coast C1, decelerate A2, accelerate A3, coast C2, decelerate A4 and then are back to the center ship. Minimize gravitational effects by testing far from gravity sources.

If direction doesn't matter, the clocks in all 6 ships that traveled should match each other in time lag since they all accelerated and traveled at the same speed and acceleration. Comparison to the stationary clock S is irrelevant.

If the 6 clocks return with different time lags, then direction matters. One explanation is that the clock-ships can be traveling at a velocity relative to space itself. Note that time dilation relative to space itself can still partially support the concept of pure relativity of time dilation relative to observers, this test will determine where these two diverge. If, at the start, the test must be "calibrated" to find the "rest frame", that proves the point, as the concept of the "rest frame" is relative to space itself.

Proof: Do the full test and compare the returned clocks. Time diffs can be used to find a vector to rest space. The faster of each pair of clocks points toward rest velocity.

Analytical Proof (thought experiment): If at C1 coasting right at velocity v there was another ship at 2v same direction, with a clock going slower due to higher velocity, then from the ship doing C1, it could repeat this experiment where it itself is the center, launching ships right and left. The one right that matches hypothetical 2v above must have slowest clock, the one left will match original central ship S faster clock, thus the direction will matter. This is trivially obvious. This test does not require visible observations of any other ship in motion as those observations aren't trustworthy.